<110> Chadwick, Brian Paul

Frischauf, Anna Maria

<120> METHODS AND COMPOSITIONS RELATING TO CD39-LIKE POLYPEPTIDES AND NUCLEIC ACIDS

<130> 28110/36120C

<140> 09/905,743

<141> 2001-07-13

<150> 09/240,639

<151> 1999-01-29

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aaa ata tcc aac cac ggg agc ctg cgg gtg gcg aag gtg gca tac ccc   285
Lys Ile Ser Asn His Gly Ser Leu Arg Val Ala Lys Val Ala Tyr Pro
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Leu Gly Leu Cys Val Gly Val Phe Ile Tyr Val Ala Tyr Ile Lys Trp
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cac cgg gcc acc gcc acc cag gcc ttc ttc agc atc acc agg gca gcc   381
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ccg ggg gcc cgg tgg ggt cag cag gcc cac agc ccc ctg ggg aca gct   429
Pro Gly Ala Arg Trp Gly Gln Gln Ala His Ser Pro Leu Gly Thr Ala
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gca gac ggg cac gag gtc ttc tac ggg atc atg ttt gat gca gga agc   477
Ala Asp Gly His Glu Val Phe Tyr Gly Ile Met Phe Asp Ala Gly Ser
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Thr Gly Thr Arg Val His Val Phe Gln Phe Thr Arg Pro Pro Arg Glu
               85   90   95

act ccc acg tta acc cac gaa acc ttc aaa gca gtg aag cca ggt ctt   573
Thr Pro Thr Leu Thr His Glu Thr Phe Lys Ala Val Lys Pro Gly Leu
         100   105   110

tct gcc tat gct gat gat gtt gaa aag agc gct cag gga atc cgg gaa   621
Ser Ala Tyr Ala Asp Asp Val Glu Lys Ser Ala Gln Gly Ile Arg Glu
115   120   125   130

cta ctg gat gtt gct aaa cag gac att ccg ttc gac ttc tgg aag gcc   669
Leu Leu Asp Val Ala Lys Gln Asp Ile Pro Phe Asp Phe Trp Lys Ala
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acc cct ctg gtc ctc aag gcc aca gct ggc tta cgc ctg tta cct gga   717
Thr Pro Leu Val Leu Lys Ala Thr Ala Gly Leu Arg Leu Leu Pro Gly
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Glu Lys Ala Gln Lys Leu Leu Gln Lys Val Lys Glu Val Phe Lys Ala
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tcg cct ttc ctt gta ggg gat gac tgt gtt tcc atc atg aac gga aca   813
Ser Pro Phe Leu Val Gly Asp Asp Cys Val Ser Ile Met Asn Gly Thr
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gat gaa ggc gtt tcg gcg tgg atc acc atc aac ttc ctg aca ggc agc   861
Asp Glu Gly Val Ser Ala Trp Ile Thr Ile Asn Phe Leu Thr Gly Ser
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ttg aaa act cca gga ggg agc agc gtg ggc atg ctg gac ttg ggc gga   909
Leu Lys Thr Pro Gly Gly Ser Ser Val Gly Met Leu Asp Leu Gly Gly
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gcc tcc cca ccc ggc tac ctg acg gca ctg cgg atg ttt aac agg acc     1005
Ala Ser Pro Pro Gly Tyr Leu Thr Ala Leu Arg Met Phe Asn Arg Thr
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tac aag ctc tat tcc tac agc tac ctc ggg ctc ggg ctg atg tcg gca     1053
Tyr Lys Leu Tyr Ser Tyr Ser Tyr Leu Gly Leu Gly Leu Met Ser Ala
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cgc ctg gcg atc ctg ggc ggc gtg gag ggg cag cct gct aag gat gga     1101
Arg Leu Ala Ile Leu Gly Gly Val Glu Gly Gln Pro Ala Lys Asp Gly
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Lys Glu Leu Val Ser Pro Cys Leu Ser Pro Ser Phe Lys Gly Glu Trp
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gaa cac gca gaa gtc acg tac agg gtt tca ggg cag aaa gca gcg gca     1197
Glu His Ala Glu Val Thr Tyr Arg Val Ser Gly Gln Lys Ala Ala Ala
            310                 315                 320

agc ctg cac gag ctg tgt gct gcc aga gtg tca gag gtc ctt caa aac     1245
Ser Leu His Glu Leu Cys Ala Ala Arg Val Ser Glu Val Leu Gln Asn
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Arg Val His Arg Thr Glu Glu Val Lys His Val Asp Phe Tyr Ala Phe
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Ser Tyr Tyr Tyr Asp Leu Ala Ala Gly Val Gly Leu Ile Asp Ala Glu
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aag gga ggc agc ctg gtg gtg ggg gac ttc gag atc gca gcc aag tac     1389
Lys Gly Gly Ser Leu Val Val Gly Asp Phe Glu Ile Ala Ala Lys Tyr
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gtg tgt cgg acc ctg gag aca cag ccg cag agc agc ccc ttc tca tgc     1437
Val Cys Arg Thr Leu Glu Thr Gln Pro Gln Ser Ser Pro Phe Ser Cys
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Met Asp Leu Thr Tyr Val Ser Leu Leu Leu Gln Glu Phe Gly Phe Pro
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agg agc aaa gtg ctg aag ctc act cgg aaa att gac aat gtt gag acc     1533
Arg Ser Lys Val Leu Lys Leu Thr Arg Lys Ile Asp Asn Val Glu Thr
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agc tgg gct ctg ggg gcc att ttt cat tac atc gac tcc ctg aac aga     1581
Ser Trp Ala Leu Gly Ala Ile Phe His Tyr Ile Asp Ser Leu Asn Arg
435                 440                 445                 450

cag aag agt cca gcc tca tagtggccga gccatccctg tccccgtcag           1629
Gln Lys Ser Pro Ala Ser
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Lys Trp His Arg Ala Thr Ala Thr Gln Ala Phe Phe Ser Ile Thr Arg
            35                  40                  45


Ala Ala Pro Gly Ala Arg Trp Gly Gln Gln Ala His Ser Pro Leu Gly
        50                  55                  60
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Thr Ala Ala Asp Gly His Glu Val Phe Tyr Gly Ile Met Phe Asp Ala
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Gly Ser Thr Gly Thr Arg Val His Val Phe Gln Phe Thr Arg Pro Pro
                85   90   95

Arg Glu Thr Pro Thr Leu Thr His Glu Thr Phe Lys Ala Val Lys Pro
            100   105   110

Gly Leu Ser Ala Tyr Ala Asp Asp Val Glu Lys Ser Ala Gln Gly Ile
            115   120   125

Arg Glu Leu Leu Asp Val Ala Lys Gln Asp Ile Pro Phe Asp Phe Trp
        130   135   140

Lys Ala Thr Pro Leu Val Leu Lys Ala Thr Ala Gly Leu Arg Leu Leu
145   150   155   160

Pro Gly Glu Lys Ala Gln Lys Leu Leu Gln Lys Val Lys Glu Val Phe
                165   170   175

Lys Ala Ser Pro Phe Leu Val Gly Asp Asp Cys Val Ser Ile Met Asn
            180   185   190

Gly Thr Asp Glu Gly Val Ser Ala Trp Ile Thr Ile Asn Phe Leu Thr
            195   200   205

Gly Ser Leu Lys Thr Pro Gly Gly Ser Ser Val Gly Met Leu Asp Leu
    210   215   220

Gly Gly Gly Ser Thr Gln Ile Ala Phe Leu Pro Arg Val Glu Gly Thr
225   230   235   240

Leu Gln Ala Ser Pro Pro Gly Tyr Leu Thr Ala Leu Arg Met Phe Asn
            245   250   255

Arg Thr Tyr Lys Leu Tyr Ser Tyr Ser Tyr Leu Gly Leu Gly Leu Met
            260   265   270

Ser Ala Arg Leu Ala Ile Leu Gly Gly Val Glu Gly Gln Pro Ala Lys
        275   280   285

Asp Gly Lys Glu Leu Val Ser Pro Cys Leu Ser Pro Ser Phe Lys Gly
    290   295   300

Glu Trp Glu His Ala Glu Val Thr Tyr Arg Val Ser Gly Gln Lys Ala
305   310   315   320

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Ala Ala Ser Leu His Glu Leu Cys Ala Ala Arg Val Ser Glu Val Leu
            325             330             335


Gln Asn Arg Val His Arg Thr Glu Glu Val Lys His Val Asp Phe Tyr
            340             345             350


Ala Phe Ser Tyr Tyr Tyr Asp Leu Ala Ala Gly Val Gly Leu Ile Asp
            355             360             365


Ala Glu Lys Gly Gly Ser Leu Val Val Gly Asp Phe Glu Ile Ala Ala
        370             375             380


Lys Tyr Val Cys Arg Thr Leu Glu Thr Gln Pro Gln Ser Ser Pro Phe
385             390             395             400


Ser Cys Met Asp Leu Thr Tyr Val Ser Leu Leu Leu Gln Glu Phe Gly
            405             410             415


Phe Pro Arg Ser Lys Val Leu Lys Leu Thr Arg Lys Ile Asp Asn Val
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Glu Thr Ser Trp Ala Leu Gly Ala Ile Phe His Tyr Ile Asp Ser Leu
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Asn Arg Gln Lys Ser Pro Ala Ser
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                         Met Phe Thr Val Leu Thr Arg Gln Pro Cys
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Glu Gln Ala Gly Leu Lys Ala Leu Tyr Arg Thr Pro Thr Ile Ile Ala
                15              20                  25

ttg gtg gtc ttg ctt gtg agt att gtg gta ctt gtg agt atc act gtc      208
Leu Val Val Leu Leu Val Ser Ile Val Val Leu Val Ser Ile Thr Val
                30              35                  40

atc cag atc cac aag caa gag gtc ctc cct cca gga ctg aag tat ggt      256
Ile Gln Ile His Lys Gln Glu Val Leu Pro Pro Gly Leu Lys Tyr Gly
                45              50                  55

att gtg ctg gat gcc ggg tct tca aga acc aca gtc tac gtg tat caa      304
Ile Val Leu Asp Ala Gly Ser Ser Arg Thr Thr Val Tyr Val Tyr Gln
            60              65                  70

tgg cca gca gaa aaa gag aat aat acc gga gtg gtc agt caa acc ttc      352
Trp Pro Ala Glu Lys Glu Asn Asn Thr Gly Val Val Ser Gln Thr Phe
75              80                  85                  90

aaa tgt agt gtg aaa ggc tct gga atc tcc agc tat gga aat aac ccc      400
Lys Cys Ser Val Lys Gly Ser Gly Ile Ser Ser Tyr Gly Asn Asn Pro
                95              100                 105

caa gat gtc ccc aga gcc ttt gag gag tgt atg caa aaa gtc aag ggg      448
Gln Asp Val Pro Arg Ala Phe Glu Glu Cys Met Gln Lys Val Lys Gly
                110             115                 120

cag gtt cca tcc cac ctc cac gga tcc acc ccc att cac ctg gga gcc      496
Gln Val Pro Ser His Leu His Gly Ser Thr Pro Ile His Leu Gly Ala
                125             130                 135

acg gct ggg atg cgc ttg ctg agg ttg caa aat gaa aca gca gct aat      544
Thr Ala Gly Met Arg Leu Leu Arg Leu Gln Asn Glu Thr Ala Ala Asn
                140             145                 150

gaa gtc ctt gaa agc atc caa agc tac ttc aag tcc cag ccc ttt gac      592
Glu Val Leu Glu Ser Ile Gln Ser Tyr Phe Lys Ser Gln Pro Phe Asp
155             160                 165                 170

ttt agg ggt gct caa atc att tct ggg caa gaa gaa ggg gta tat gga      640
Phe Arg Gly Ala Gln Ile Ile Ser Gly Gln Glu Glu Gly Val Tyr Gly
                175             180                 185

tgg att aca gcc aac tat tta atg gga aat ttc ctg gag aag aac ctg      688
Trp Ile Thr Ala Asn Tyr Leu Met Gly Asn Phe Leu Glu Lys Asn Leu
                190             195                 200

tgg cac atg tgg gtg cac ccg cat gga gtg gaa acc acg ggt gcc ctg      736
Trp His Met Trp Val His Pro His Gly Val Glu Thr Thr Gly Ala Leu
                205             210                 215

gac tta ggt ggt gcc tcc acc caa ata tcc ttc gtg gca gga gag aag      784
Asp Leu Gly Gly Ala Ser Thr Gln Ile Ser Phe Val Ala Gly Glu Lys
                220             225                 230

atg gat ctg aac acc agc gac atc atg cag gtg tcc ctg tat ggc tac      832
Met Asp Leu Asn Thr Ser Asp Ile Met Gln Val Ser Leu Tyr Gly Tyr
235             240                 245                 250

gta tac acg ctc tac aca cac agc ttc cag tgc tat ggc cgg aat gag      880
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Val Tyr Thr Leu Tyr Thr His Ser Phe Gln Cys Tyr Gly Arg Asn Glu
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gct gag aag aag ttt ctg gca atg ctc ctg cag aat tct cct acc aaa    928
Ala Glu Lys Lys Phe Leu Ala Met Leu Leu Gln Asn Ser Pro Thr Lys
            270             275             280

aac cat ctc acc aat ccc tgt tac cct cgg gat tat agc atc agc ttc    976
Asn His Leu Thr Asn Pro Cys Tyr Pro Arg Asp Tyr Ser Ile Ser Phe
            285             290             295

acc atg ggc cat gta ttt gat agc ctg tgc act gtg gac cag agg cca   1024
Thr Met Gly His Val Phe Asp Ser Leu Cys Thr Val Asp Gln Arg Pro
     300             305             310

gaa agt tat aac ccc aat gat gtc atc act ttt gaa gga act ggg gac   1072
Glu Ser Tyr Asn Pro Asn Asp Val Ile Thr Phe Glu Gly Thr Gly Asp
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cca tct ctg tgt aag gag aag gtg gct tcc ata ttt gac ttc aaa gct   1120
Pro Ser Leu Cys Lys Glu Lys Val Ala Ser Ile Phe Asp Phe Lys Ala
            335             340             345

tgc cat gat caa gaa acc tgt tct ttt gat ggg gtt tat cag cca aag   1168
Cys His Asp Gln Glu Thr Cys Ser Phe Asp Gly Val Tyr Gln Pro Lys
            350             355             360

att aaa ggg cca ttt gtg gct ttt gca gga ttc tac tac aca gcc agt   1216
Ile Lys Gly Pro Phe Val Ala Phe Ala Gly Phe Tyr Tyr Thr Ala Ser
            365             370             375

gct tta aat ctt tca ggt agc ttt tcc ctg gac acc ttc aac tcc agc   1264
Ala Leu Asn Leu Ser Gly Ser Phe Ser Leu Asp Thr Phe Asn Ser Ser
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acc tgg aat ttc tgc tca cag aat tgg agt cag ctc cca ctg ctg ctc   1312
Thr Trp Asn Phe Cys Ser Gln Asn Trp Ser Gln Leu Pro Leu Leu Leu
395             400             405             410

ccc aaa ttt gat gag gta tat gcc cgc tct tac tgc ttc tca gcc aac   1360
Pro Lys Phe Asp Glu Val Tyr Ala Arg Ser Tyr Cys Phe Ser Ala Asn
            415             420             425

tac atc tac cac ttg ttt gtg aac ggt tac aaa ttc aca gag gag act   1408
Tyr Ile Tyr His Leu Phe Val Asn Gly Tyr Lys Phe Thr Glu Glu Thr
            430             435             440

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Trp Pro Gln Ile His Phe Glu Lys Glu Val Gly Asn Ser Ser Ile Ala
            445             450             455

tgg tct ctt ggc tac atg ctc agc ctg acc aac cag atc cca gct gaa   1504
Trp Ser Leu Gly Tyr Met Leu Ser Leu Thr Asn Gln Ile Pro Ala Glu
     460             465             470

agc cct ctg atc cgt ctg ccc ata gaa cca cct gtc ttt gtg ggc acc   1552
Ser Pro Leu Ile Arg Leu Pro Ile Glu Pro Pro Val Phe Val Gly Thr
475             480             485             490

ctc gct ttc ttc aca gtg gca gcc ttg ctg tgt ctg gca ttt ctt gca   1600
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            495             500             505
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Asp His Ala Val Asp Ser Asp
            525
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Ser Ile Val Val Leu Val Ser Ile Thr Val Ile Gln Ile His Lys Gln
            35              40              45

Glu Val Leu Pro Pro Gly Leu Lys Tyr Gly Ile Val Leu Asp Ala Gly
    50              55              60

Ser Ser Arg Thr Thr Val Tyr Val Tyr Gln Trp Pro Ala Glu Lys Glu
65              70              75              80

Asn Asn Thr Gly Val Val Ser Gln Thr Phe Lys Cys Ser Val Lys Gly
            85              90              95

Ser Gly Ile Ser Ser Tyr Gly Asn Asn Pro Gln Asp Val Pro Arg Ala
            100             105             110

Phe Glu Glu Cys Met Gln Lys Val Lys Gly Gln Val Pro Ser His Leu
    115             120             125

His Gly Ser Thr Pro Ile His Leu Gly Ala Thr Ala Gly Met Arg Leu
    130             135             140

Leu Arg Leu Gln Asn Glu Thr Ala Ala Asn Glu Val Leu Glu Ser Ile
145             150             155             160

Gln Ser Tyr Phe Lys Ser Gln Pro Phe Asp Phe Arg Gly Ala Gln Ile
            165             170             175

Ile Ser Gly Gln Glu Glu Gly Val Tyr Gly Trp Ile Thr Ala Asn Tyr
            180             185             190

Leu Met Gly Asn Phe Leu Glu Lys Asn Leu Trp His Met Trp Val His
    195             200             205

Pro His Gly Val Glu Thr Thr Gly Ala Leu Asp Leu Gly Gly Ala Ser
    210             215             220

Thr Gln Ile Ser Phe Val Ala Gly Glu Lys Met Asp Leu Asn Thr Ser
225             230             235             240

Asp Ile Met Gln Val Ser Leu Tyr Gly Tyr Val Tyr Thr Leu Tyr Thr
            245             250             255

His Ser Phe Gln Cys Tyr Gly Arg Asn Glu Ala Glu Lys Lys Phe Leu
            260             265             270
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Ala Met Leu Leu Gln Asn Ser Pro Thr Lys Asn His Leu Thr Asn Pro
      275   280   285

Cys Tyr Pro Arg Asp Tyr Ser Ile Ser Phe Thr Met Gly His Val Phe
      290   295   300

Asp Ser Leu Cys Thr Val Asp Gln Arg Pro Glu Ser Tyr Asn Pro Asn
305   310   315   320

Asp Val Ile Thr Phe Glu Gly Thr Gly Asp Pro Ser Leu Cys Lys Glu
305   325   330   335

Lys Val Ala Ser Ile Phe Asp Phe Lys Ala Cys His Asp Gln Glu Thr
        340   345   350

Cys Ser Phe Asp Gly Val Tyr Gln Pro Lys Ile Lys Gly Pro Phe Val
      355   360   365

Ala Phe Ala Gly Phe Tyr Tyr Thr Ala Ser Ala Leu Asn Leu Ser Gly
      370   375   380

Ser Phe Ser Leu Asp Thr Phe Asn Ser Ser Thr Trp Asn Phe Cys Ser
385   390   395   400

Gln Asn Trp Ser Gln Leu Pro Leu Leu Leu Pro Lys Phe Asp Glu Val
        405   410   415

Tyr Ala Arg Ser Tyr Cys Phe Ser Ala Asn Tyr Ile Tyr His Leu Phe
        420   425   430

Val Asn Gly Tyr Lys Phe Thr Glu Glu Thr Trp Pro Gln Ile His Phe
        435   440   445

Glu Lys Glu Val Gly Asn Ser Ser Ile Ala Trp Ser Leu Gly Tyr Met
      450   455   460

Leu Ser Leu Thr Asn Gln Ile Pro Ala Glu Ser Pro Leu Ile Arg Leu
465   470   475   480

Pro Ile Glu Pro Pro Val Phe Val Gly Thr Leu Ala Phe Phe Thr Val
        485   490   495

Ala Ala Leu Leu Cys Leu Ala Phe Leu Ala Tyr Leu Cys Ser Ala Thr
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Arg Arg Lys Arg His Ser Glu His Ala Phe Asp His Ala Val Asp Ser
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aaaaagtgat ataataaagg aaccaaggag aaaattcaga aggaaagaaa aaattgcctc     180

tgcaggtgtg cgagcaggat tgcttctgca acaaaagcct ccacccagcc acatcttggg     240
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aaaaga atg gcc act tct tgg ggc aca gtc ttt ttc atg ctg gtg gta         288
        Met Ala Thr Ser Trp Gly Thr Val Phe Phe Met Leu Val Val
         1               5                       10
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tcc tgt gtt tgc agc gct gtc tcc cac agg aac cag cag act tgg ttt        336
Ser Cys Val Cys Ser Ala Val Ser His Arg Asn Gln Gln Thr Trp Phe
15                  20                  25                  30
```

```
gag ggt atc ttc ctg tct tcc atg tgc ccc atc aat gtc agc gcc agc        384
Glu Gly Ile Phe Leu Ser Ser Met Cys Pro Ile Asn Val Ser Ala Ser
                35                  40                  45
```

```
acc ttg tat gga att atg ttt gat gca ggg agc act gga act cga att        432
Thr Leu Tyr Gly Ile Met Phe Asp Ala Gly Ser Thr Gly Thr Arg Ile
            50                  55                  60
```

```
cat gtt tac acc ttt gtg cag aaa atg cca gga cag ctt cca att cta        480
His Val Tyr Thr Phe Val Gln Lys Met Pro Gly Gln Leu Pro Ile Leu
        65                  70                  75
```

```
gaa ggg gaa gtt ttt gat tct gtg aag cca gga ctt tct gct ttt gta        528
Glu Gly Glu Val Phe Asp Ser Val Lys Pro Gly Leu Ser Ala Phe Val
        80                  85                  90
```

```
gat caa cct aag cag ggt gct gag acc gtt caa ggg ctc tta gag gtg        576
Asp Gln Pro Lys Gln Gly Ala Glu Thr Val Gln Gly Leu Leu Glu Val
95                  100                 105                 110
```

```
gcc aaa gac tca atc ccc cga agt cac tgg aaa aag acc cca gtg gtc    624
Ala Lys Asp Ser Ile Pro Arg Ser His Trp Lys Lys Thr Pro Val Val
            115         120              125

cta aag gca aca gca gga cta cgc tta ctg cca gaa cac aaa gcc aag    672
Leu Lys Ala Thr Ala Gly Leu Arg Leu Leu Pro Glu His Lys Ala Lys
            130         135              140

gct ctg ctc ttt gag gta aag gag atc ttc agg aag tca cct ttc ctg    720
Ala Leu Leu Phe Glu Val Lys Glu Ile Phe Arg Lys Ser Pro Phe Leu
            145         150              155

gta cca aag ggc agt gtt agc atc atg gat gga tcc gac gaa ggc ata    768
Val Pro Lys Gly Ser Val Ser Ile Met Asp Gly Ser Asp Glu Gly Ile
            160         165              170

tta gct tgg gtt act gtg aat ttt ctg aca ggt cag ctg cat ggc cac    816
Leu Ala Trp Val Thr Val Asn Phe Leu Thr Gly Gln Leu His Gly His
175             180              185              190

aga cag gag act gtg ggg acc ttg gac cta ggg gga gcc tcc acc caa    864
Arg Gln Glu Thr Val Gly Thr Leu Asp Leu Gly Gly Ala Ser Thr Gln
            195         200              205

atc acg ttc ctg ccc cag ttt gag aaa act ctg gaa caa act cct agg    912
Ile Thr Phe Leu Pro Gln Phe Glu Lys Thr Leu Glu Gln Thr Pro Arg
            210         215              220

ggc tac ctc act tcc ttt gag atg ttt aac agc act tat aag ctc tat    960
Gly Tyr Leu Thr Ser Phe Glu Met Phe Asn Ser Thr Tyr Lys Leu Tyr
            225         230              235

aca cat agt tac ttg gga ttt gga ttg aaa gct gca aga cta gca acc   1008
Thr His Ser Tyr Leu Gly Phe Gly Leu Lys Ala Ala Arg Leu Ala Thr
            240         245              250

ctg gga gcc ctg gag aca gaa ggg act gat ggg cac act ttc cgg agt   1056
Leu Gly Ala Leu Glu Thr Glu Gly Thr Asp Gly His Thr Phe Arg Ser
255             260              265              270

gcc tgt tta ccg aga tgg ttg gaa gca gag tgg atc ttt ggg ggt gtg   1104
Ala Cys Leu Pro Arg Trp Leu Glu Ala Glu Trp Ile Phe Gly Gly Val
            275         280              285

aaa tac cag tat ggt ggc aac caa gaa ggg gag gtg ggc ttt gag ccc   1152
Lys Tyr Gln Tyr Gly Gly Asn Gln Glu Gly Glu Val Gly Phe Glu Pro
            290         295              300

tgc tat gcc gaa gtg ctg agg gtg gta cga gga aaa ctt cac cag cca   1200
Cys Tyr Ala Glu Val Leu Arg Val Val Arg Gly Lys Leu His Gln Pro
            305         310              315

gag gag gtc cag aga ggt tcc ttc tat gct ttc tct tac tat tat gac   1248
Glu Glu Val Gln Arg Gly Ser Phe Tyr Ala Phe Ser Tyr Tyr Tyr Asp
            320         325              330

cga gct gtt gac aca gac atg att gat tat gaa aag ggg ggt att tta   1296
Arg Ala Val Asp Thr Asp Met Ile Asp Tyr Glu Lys Gly Gly Ile Leu
335             340              345              350

aaa gtt gaa gat ttt gaa aga aaa gcc agg gaa gtg tgt gat aac ttg   1344
Lys Val Glu Asp Phe Glu Arg Lys Ala Arg Glu Val Cys Asp Asn Leu
            355         360              365
```

```
gaa aac ttc acc tca ggc agt cct ttc ctg tgc atg gat ctc agc tac    1392
Glu Asn Phe Thr Ser Gly Ser Pro Phe Leu Cys Met Asp Leu Ser Tyr
        370             375             380

atc aca gcc ctg tta aag gat ggc ttt ggc ttt gca gac agc aca gtc    1440
Ile Thr Ala Leu Leu Lys Asp Gly Phe Gly Phe Ala Asp Ser Thr Val
        385             390             395

tta cag ctc aca aag aaa gtg aac aac ata gag acg ggc tgg gcc ttg    1488
Leu Gln Leu Thr Lys Lys Val Asn Asn Ile Glu Thr Gly Trp Ala Leu
    400             405             410

ggg gcc acc ttt cac ctg ttg cag tct ctg ggc atc tcc cat            1530
Gly Ala Thr Phe His Leu Leu Gln Ser Leu Gly Ile Ser His
415             420             425

tgaggccacg tacttccttg gagacctgca tttgccaaca cctttttaag gggaggagag    1590

agcacttagt ttctgaacta gtctgggaca tcctggactt gagcctagag atttaggttt    1650

aattaatttt acacatctaa tgtgaactgc tgcctaacca ctcaagagta cacagctggc    1710

accagagcat cacagagagc cctgtgagcc aaaaagtata gttttggaac ttaaccttgg    1770

agtgagagcc cagggacagg tccctggaaa ccaaagaaaa atcgcatttc aaccctttga    1830

gtgcctcatt ccactgaata tttaaatttt cctcttaaat ggtaaactga cttattgcaa    1890

tcccaagacc catcaatatc agtattttt tcctccctat acagtgccct gcccaccctt    1950

atctgcaccc acctcccctg aaaaagagag aaaaaaaaaa aaaaaaaa               1998
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<210> 6

<211> 428

<212> PRT

<213> Homo sapiens

<400> 6

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Met Ala Thr Ser Trp Gly Thr Val Phe Phe Met Leu Val Val Ser Cys
1               5               10              15

Val Cys Ser Ala Val Ser His Arg Asn Gln Gln Thr Trp Phe Glu Gly
            20              25              30

Ile Phe Leu Ser Ser Met Cys Pro Ile Asn Val Ser Ala Ser Thr Leu
        35              40              45

Tyr Gly Ile Met Phe Asp Ala Gly Ser Thr Gly Thr Arg Ile His Val
    50              55              60

Tyr Thr Phe Val Gln Lys Met Pro Gly Gln Leu Pro Ile Leu Glu Gly
```

65   70   75   80

Glu Val Phe Asp Ser Val Lys Pro Gly Leu Ser Ala Phe Val Asp Gln
              85   90   95

Pro Lys Gln Gly Ala Glu Thr Val Gln Gly Leu Leu Glu Val Ala Lys
              100   105   110

Asp Ser Ile Pro Arg Ser His Trp Lys Lys Thr Pro Val Val Leu Lys
              115   120   125

Ala Thr Ala Gly Leu Arg Leu Leu Pro Glu His Lys Ala Lys Ala Leu
          130   135   140

Leu Phe Glu Val Lys Glu Ile Phe Arg Lys Ser Pro Phe Leu Val Pro
145   150   155   160

Lys Gly Ser Val Ser Ile Met Asp Gly Ser Asp Glu Gly Ile Leu Ala
              165   170   175

Trp Val Thr Val Asn Phe Leu Thr Gly Gln Leu His Gly His Arg Gln
              180   185   190

Glu Thr Val Gly Thr Leu Asp Leu Gly Gly Ala Ser Thr Gln Ile Thr
              195   200   205

Phe Leu Pro Gln Phe Glu Lys Thr Leu Glu Gln Thr Pro Arg Gly Tyr
    210   215   220

Leu Thr Ser Phe Glu Met Phe Asn Ser Thr Tyr Lys Leu Tyr Thr His
225   230   235   240

Ser Tyr Leu Gly Phe Gly Leu Lys Ala Ala Arg Leu Ala Thr Leu Gly
              245   250   255

Ala Leu Glu Thr Glu Gly Thr Asp Gly His Thr Phe Arg Ser Ala Cys
              260   265   270

Leu Pro Arg Trp Leu Glu Ala Glu Trp Ile Phe Gly Gly Val Lys Tyr
          275   280   285

Gln Tyr Gly Gly Asn Gln Glu Gly Glu Val Gly Phe Glu Pro Cys Tyr
    290   295   300

Ala Glu Val Leu Arg Val Val Arg Gly Lys Leu His Gln Pro Glu Glu
305   310   315   320

```
Val Gln Arg Gly Ser Phe Tyr Ala Phe Ser Tyr Tyr Tyr Asp Arg Ala
            325             330             335


Val Asp Thr Asp Met Ile Asp Tyr Glu Lys Gly Gly Ile Leu Lys Val
            340             345             350


Glu Asp Phe Glu Arg Lys Ala Arg Glu Val Cys Asp Asn Leu Glu Asn
            355             360             365


Phe Thr Ser Gly Ser Pro Phe Leu Cys Met Asp Leu Ser Tyr Ile Thr
    370             375             380


Ala Leu Leu Lys Asp Gly Phe Gly Phe Ala Asp Ser Thr Val Leu Gln
385             390             395             400


Leu Thr Lys Lys Val Asn Asn Ile Glu Thr Gly Trp Ala Leu Gly Ala
            405             410             415


Thr Phe His Leu Leu Gln Ser Leu Gly Ile Ser His
            420             425
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<210> 7

<211> 2119

<212> DNA

<213> Mus musculus

<220>

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<222> (205)..(1599)

<223>

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atgtgctttt taaattggcc tgcgtgaccc gcccacttgg tgtaaaagaa gaaccggcca     120

aagggagggc ctgaaggacc tccacaggag tgtgagcagc actgcttcag caacaaagcc     180

tcaggtccac atcttgggaa gaat atg gcc act tcc tgg ggg gct gtc ttc     231
                          Met Ala Thr Ser Trp Gly Ala Val Phe
                          1               5

atg ctg atc ata gcc tgc gtt ggc agc act gtc ttc tac aga gaa cag     279
Met Leu Ile Ile Ala Cys Val Gly Ser Thr Val Phe Tyr Arg Glu Gln
10              15              20              25
```

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```
cag acc tgg ttt gaa ggt gtc ttc ttg tct tcc atg tgc ccc att aat        327
Gln Thr Trp Phe Glu Gly Val Phe Leu Ser Ser Met Cys Pro Ile Asn
            30                  35                  40

gtc agt gcc ggc acc ttt tat gga att atg ttt gat gcg ggc agc act        375
Val Ser Ala Gly Thr Phe Tyr Gly Ile Met Phe Asp Ala Gly Ser Thr
            45                  50                  55

gga gct cgg att cat gtt tac act ttt gtg cag aaa aca gca gga cag        423
Gly Ala Arg Ile His Val Tyr Thr Phe Val Gln Lys Thr Ala Gly Gln
            60                  65                  70

ctc ccc ttt ctg gaa ggt gaa att ttt gat tct gtg aag ccg gga ctt        471
Leu Pro Phe Leu Glu Gly Glu Ile Phe Asp Ser Val Lys Pro Gly Leu
            75                  80                  85

tct gct ttt gtg gat cag ccc aaa cag ggt gct gag act gtc cag gag        519
Ser Ala Phe Val Asp Gln Pro Lys Gln Gly Ala Glu Thr Val Gln Glu
90                  95                  100                 105

ctc ttg gag gtg gcc aaa gac tcg atc ccc aga agc cac tgg gaa agg        567
Leu Leu Glu Val Ala Lys Asp Ser Ile Pro Arg Ser His Trp Glu Arg
            110                 115                 120

acc ccg gtg gtt ctg aaa gca acg gcc gga ctc cgt ttg ctg cct gag        615
Thr Pro Val Val Leu Lys Ala Thr Ala Gly Leu Arg Leu Leu Pro Glu
            125                 130                 135

cag aaa gcc cag gct ctg ctc ttg gag gta gag gag atc ttc aag aat        663
Gln Lys Ala Gln Ala Leu Leu Leu Glu Val Glu Glu Ile Phe Lys Asn
            140                 145                 150

tca cct ttc ctg gtc cca gat ggc agc gtt agc atc atg gat ggg tcc        711
Ser Pro Phe Leu Val Pro Asp Gly Ser Val Ser Ile Met Asp Gly Ser
            155                 160                 165

tat gaa ggc ata cta gcc tgg gtt acc gtg aac ttt cta aca ggt cag        759
Tyr Glu Gly Ile Leu Ala Trp Val Thr Val Asn Phe Leu Thr Gly Gln
170                 175                 180                 185

ctg cat ggt cgt ggc cag gag act gtg ggg acc ctt gac ctg ggg ggt        807
Leu His Gly Arg Gly Gln Glu Thr Val Gly Thr Leu Asp Leu Gly Gly
            190                 195                 200

gcc tcc acc caa atc acg ttt cta ccc cag ttt gag aaa acc ctg gaa        855
Ala Ser Thr Gln Ile Thr Phe Leu Pro Gln Phe Glu Lys Thr Leu Glu
            205                 210                 215

caa aca cct agg ggc tac ctc act tcc ttt gag atg ttt aac agc act        903
Gln Thr Pro Arg Gly Tyr Leu Thr Ser Phe Glu Met Phe Asn Ser Thr
            220                 225                 230

ttt aag ctc tat aca cat agt tac ttg gga ttt gga ctg aaa gct gca        951
Phe Lys Leu Tyr Thr His Ser Tyr Leu Gly Phe Gly Leu Lys Ala Ala
            235                 240                 245

aga ctg gca act ctg gga gcc ctg gaa gca aaa ggg act gat gga cat        999
Arg Leu Ala Thr Leu Gly Ala Leu Glu Ala Lys Gly Thr Asp Gly His
250                 255                 260                 265

acg ttt cga agt gcc tgt tta cca aga tgg ttg gaa gca gag tgg atc       1047
Thr Phe Arg Ser Ala Cys Leu Pro Arg Trp Leu Glu Ala Glu Trp Ile
            270                 275                 280
```

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```
ttt ggg ggt gtg aaa tac cag tat ggt ggt aac caa gaa ggg gag atg     1095
Phe Gly Gly Val Lys Tyr Gln Tyr Gly Gly Asn Gln Glu Gly Glu Met
        285                 290                 295

ggc ttt gaa ccc tgc tat gcg gaa gtg ctg agg gta gta cag ggg aaa     1143
Gly Phe Glu Pro Cys Tyr Ala Glu Val Leu Arg Val Val Gln Gly Lys
        300                 305                 310

ctt cac cag cca gaa gaa gtc cga gga agc gcc ttc tac gct ttc tct     1191
Leu His Gln Pro Glu Glu Val Arg Gly Ser Ala Phe Tyr Ala Phe Ser
        315                 320                 325

tac tac tac gat cga gcc gct gac aca cac ttg atc gat tat gaa aag     1239
Tyr Tyr Tyr Asp Arg Ala Ala Asp Thr His Leu Ile Asp Tyr Glu Lys
330                 335                 340                 345

ggc ggg gtt tta aaa gtt gaa gat ttt gaa aga aaa gcc aga gaa gtg     1287
Gly Gly Val Leu Lys Val Glu Asp Phe Glu Arg Lys Ala Arg Glu Val
        350                 355                 360

tgt gac aac ttg ggg agc ttc tcc tcg ggc agt cct ttc ctc tgc atg     1335
Cys Asp Asn Leu Gly Ser Phe Ser Ser Gly Ser Pro Phe Leu Cys Met
        365                 370                 375

gac ctc act tac atc aca gcc ctg ttg aaa gat ggt ttg ggc ttt gcc     1383
Asp Leu Thr Tyr Ile Thr Ala Leu Leu Lys Asp Gly Leu Gly Phe Ala
        380                 385                 390

gaa cgg cac cct ctt aca gct cac aaa gaa agt gaa caa cat aga gac     1431
Glu Arg His Pro Leu Thr Ala His Lys Glu Ser Glu Gln His Arg Asp
        395                 400                 405

tgg ttg ggc ctt ggg ggc cac ctt tca cct gct cca gtc tct ggg cat     1479
Trp Leu Gly Leu Gly Gly His Leu Ser Pro Ala Pro Val Ser Gly His
410                 415                 420                 425

cac cag ctg agg cca agc tcc acc tct gaa gcc tgc att tct gaa cca     1527
His Gln Leu Arg Pro Ser Ser Thr Ser Glu Ala Cys Ile Ser Glu Pro
                430                 435                 440

gtt ttc tca cag gaa ggc gtg gac tca gag aca ttt tct gac ctc tct     1575
Val Phe Ser Gln Glu Gly Val Asp Ser Glu Thr Phe Ser Asp Leu Ser
        445                 450                 455

gga aaa gcc tgg ccc gaa acc cgt taactggttt tataaggagg gaggggtttt   1629
Gly Lys Ala Trp Pro Glu Thr Arg
        460                 465

tagatgagtc ttgctcttga gcctagtgat ttgggcttca atgatttgca catctaatgt   1689

gaatagctcc taaccacttg gtgggtgcat ggctggcacc agactgtaaa tcttttggga   1749

ttctttgtac agagtcctgc aaaggaaaaa agagaaaagg tttggaactc catgctagat   1809

tgcgagttca gagacaggtc cctggggacc aaagaacaat ctcgtttcaa cccttggatg   1869

cctcattgct ttgaatggat tcatttttgc ttataagctg atttactgaa atcccataac   1929

ccatcaatgc tgttaatttt tttcttccta cccttattac attccctacc ctaaaagcct   1989

ggggggaaata cctggttttg cttcccatct ataattgaga aagagggggg aaaagatact   2049
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gtattagaat ttgtgtgatc ctgtggcaca atagatcaac caacccattt aaagcttaaa   2109

aaaaaaaaaa   2119

<210> 8

<211> 465

<212> PRT

<213> Mus musculus

<400> 8

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Met Ala Thr Ser Trp Gly Ala Val Phe Met Leu Ile Ile Ala Cys Val
1               5                   10                  15

Gly Ser Thr Val Phe Tyr Arg Glu Gln Gln Thr Trp Phe Glu Gly Val
            20                  25                  30

Phe Leu Ser Ser Met Cys Pro Ile Asn Val Ser Ala Gly Thr Phe Tyr
        35                  40                  45

Gly Ile Met Phe Asp Ala Gly Ser Thr Gly Ala Arg Ile His Val Tyr
    50                  55                  60

Thr Phe Val Gln Lys Thr Ala Gly Gln Leu Pro Phe Leu Glu Gly Glu
65                  70                  75                  80

Ile Phe Asp Ser Val Lys Pro Gly Leu Ser Ala Phe Val Asp Gln Pro
                85                  90                  95

Lys Gln Gly Ala Glu Thr Val Gln Glu Leu Leu Glu Val Ala Lys Asp
            100                 105                 110

Ser Ile Pro Arg Ser His Trp Glu Arg Thr Pro Val Val Leu Lys Ala
        115                 120                 125

Thr Ala Gly Leu Arg Leu Leu Pro Glu Gln Lys Ala Gln Ala Leu Leu
    130                 135                 140

Leu Glu Val Glu Glu Ile Phe Lys Asn Ser Pro Phe Leu Val Pro Asp
145                 150                 155                 160

Gly Ser Val Ser Ile Met Asp Gly Ser Tyr Glu Gly Ile Leu Ala Trp
                165                 170                 175

Val Thr Val Asn Phe Leu Thr Gly Gln Leu His Gly Arg Gly Gln Glu
            180                 185                 190
```

Thr Val Gly Thr Leu Asp Leu Gly Gly Ala Ser Thr Gln Ile Thr Phe
  195   200   205

Leu Pro Gln Phe Glu Lys Thr Leu Glu Gln Thr Pro Arg Gly Tyr Leu
 210   215   220

Thr Ser Phe Glu Met Phe Asn Ser Thr Phe Lys Leu Tyr Thr His Ser
225   230   235   240

Tyr Leu Gly Phe Gly Leu Lys Ala Ala Arg Leu Ala Thr Leu Gly Ala
    245   250   255

Leu Glu Ala Lys Gly Thr Asp Gly His Thr Phe Arg Ser Ala Cys Leu
   260   265   270

Pro Arg Trp Leu Glu Ala Glu Trp Ile Phe Gly Gly Val Lys Tyr Gln
   275   280   285

Tyr Gly Gly Asn Gln Glu Gly Glu Met Gly Phe Glu Pro Cys Tyr Ala
  290   295   300

Glu Val Leu Arg Val Val Gln Gly Lys Leu His Gln Pro Glu Glu Val
305   310   315   320

Arg Gly Ser Ala Phe Tyr Ala Phe Ser Tyr Tyr Tyr Asp Arg Ala Ala
    325   330   335

Asp Thr His Leu Ile Asp Tyr Glu Lys Gly Gly Val Leu Lys Val Glu
   340   345   350

Asp Phe Glu Arg Lys Ala Arg Glu Val Cys Asp Asn Leu Gly Ser Phe
  355   360   365

Ser Ser Gly Ser Pro Phe Leu Cys Met Asp Leu Thr Tyr Ile Thr Ala
 370   375   380

Leu Leu Lys Asp Gly Leu Gly Phe Ala Glu Arg His Pro Leu Thr Ala
385   390   395   400

His Lys Glu Ser Glu Gln His Arg Asp Trp Leu Gly Leu Gly Gly His
   405   410   415

Leu Ser Pro Ala Pro Val Ser Gly His His Gln Leu Arg Pro Ser Ser
   420   425   430

Thr Ser Glu Ala Cys Ile Ser Glu Pro Val Phe Ser Gln Glu Gly Val

435   440   445

Asp Ser Glu Thr Phe Ser Asp Leu Ser Gly Lys Ala Trp Pro Glu Thr
    450   455   460

Arg
465

<210> 9

<211> 428

<212> PRT

<213> Homo sapiens

<400> 9

Met Ala Thr Ser Trp Gly Thr Val Phe Phe Met Leu Val Val Ser Cys
1   5   10   15

Val Cys Ser Ala Val Ser His Arg Asn Gln Gln Thr Trp Phe Glu Gly
            20   25   30

Ile Phe Leu Ser Ser Met Cys Pro Ile Asn Val Ser Ala Ser Thr Leu
        35   40   45

Tyr Gly Ile Met Phe Asp Ala Gly Ser Thr Gly Thr Arg Ile His Val
    50   55   60

Tyr Thr Phe Val Gln Lys Met Pro Gly Gln Leu Pro Ile Leu Glu Gly
65   70   75   80

Glu Val Phe Asp Ser Val Lys Pro Gly Leu Ser Ala Phe Val Asp Gln
            85   90   95

Pro Lys Gln Gly Ala Glu Thr Val Gln Gly Leu Leu Glu Val Ala Lys
            100   105   110

Asp Ser Ile Pro Arg Ser His Trp Lys Lys Thr Pro Val Val Leu Lys
        115   120   125

Ala Thr Ala Gly Leu Arg Leu Leu Pro Glu His Lys Ala Lys Ala Leu
    130   135   140

Leu Phe Glu Val Lys Glu Ile Phe Arg Lys Ser Pro Phe Leu Val Pro
145   150   155   160

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Lys Gly Ser Val Ser Ile Met Asp Gly Ser Asp Glu Gly Ile Leu Ala
            165   170   175

Trp Val Thr Val Asn Phe Leu Thr Gly Gln Leu His Gly His Arg Gln
            180   185   190

Glu Thr Val Gly Thr Leu Asp Leu Gly Gly Ala Ser Thr Gln Ile Thr
            195   200   205

Phe Leu Pro Gln Phe Glu Lys Thr Leu Glu Gln Thr Pro Arg Gly Tyr
    210   215   220

Leu Thr Ser Phe Glu Met Phe Asn Ser Thr Tyr Lys Leu Tyr Thr His
225   230   235   240

Ser Tyr Leu Gly Phe Gly Leu Lys Ala Ala Arg Leu Ala Thr Leu Gly
            245   250   255

Ala Leu Glu Thr Glu Gly Thr Asp Gly His Thr Phe Arg Ser Ala Cys
            260   265   270

Leu Pro Arg Trp Leu Glu Ala Glu Trp Ile Phe Gly Gly Val Lys Tyr
            275   280   285

Gln Tyr Gly Gly Asn Gln Glu Gly Glu Val Gly Phe Glu Pro Cys Tyr
    290   295   300

Ala Glu Val Leu Arg Val Val Arg Gly Lys Leu His Gln Pro Glu Glu
305   310   315   320

Val Gln Arg Gly Ser Phe Tyr Ala Phe Ser Tyr Tyr Tyr Asp Arg Ala
            325   330   335

Val Asp Thr Asp Met Ile Asp Tyr Glu Lys Gly Gly Ile Leu Lys Val
            340   345   350

Glu Asp Phe Glu Arg Lys Ala Arg Glu Val Cys Asp Asn Leu Glu Asn
            355   360   365

Phe Thr Ser Gly Ser Pro Phe Leu Cys Met Asp Leu Ser Tyr Ile Thr
    370   375   380

Ala Leu Leu Lys Asp Gly Phe Gly Phe Ala Asp Ser Thr Val Leu Gln
385   390   395   400

Leu Thr Lys Lys Val Asn Asn Ile Glu Thr Gly Trp Ala Leu Gly Ala
            405   410   415

Thr Phe His Leu Leu Gln Ser Leu Gly Ile Ser His
          420   425

<210> 10

<211> 455

<212> PRT

<213> P. sativum

<400> 10

Met Glu Leu Leu Ile Lys Leu Ile Thr Phe Leu Leu Phe Ser Met Pro
1   5   10   15

Ala Ile Thr Ser Ser Gln Tyr Leu Gly Asn Asn Leu Leu Thr Ser Arg
         20   25   30

Lys Ile Phe Leu Lys Gln Glu Glu Ile Ser Ser Tyr Ala Val Val Phe
         35   40   45

Asp Ala Gly Ser Thr Gly Ser Arg Ile His Val Tyr His Phe Asn Gln
     50   55   60

Asn Leu Asp Leu Leu His Ile Gly Lys Gly Val Glu Tyr Tyr Asn Lys
65   70   75   80

Ile Thr Pro Gly Leu Ser Ser Tyr Ala Asn Asn Pro Glu Gln Ala Ala
         85   90   95

Lys Ser Leu Ile Pro Leu Leu Glu Gln Ala Glu Asp Val Val Pro Asp
         100   105   110

Asp Leu Gln Pro Lys Thr Pro Val Arg Leu Gly Ala Thr Ala Gly Leu
         115   120   125

Arg Leu Leu Asn Gly Asp Ala Ser Glu Lys Ile Leu Gln Ser Val Arg
        130   135   140

Asp Met Leu Ser Asn Arg Ser Thr Phe Asn Val Gln Pro Asp Ala Val
145   150   155   160

Ser Ile Ile Asp Gly Thr Gln Glu Gly Ser Tyr Leu Trp Val Thr Val
         165   170   175

Asn Tyr Ala Leu Gly Asn Leu Gly Lys Lys Tyr Thr Lys Thr Val Gly
         180   185   190

Val Ile Asp Leu Gly Gly Gly Ser Val Gln Met Ala Tyr Ala Val Ser
        195   200   205

Lys Lys Thr Ala Lys Asn Ala Pro Lys Val Ala Asp Gly Asp Asp Pro
    210   215   220

Tyr Ile Lys Lys Val Val Leu Lys Gly Ile Pro Tyr Asp Leu Tyr Val
225   230   235   240

His Ser Tyr Leu His Phe Gly Arg Glu Ala Ser Arg Ala Glu Ile Leu
                245   250   255

Lys Leu Thr Pro Arg Ser Pro Asn Pro Cys Leu Leu Ala Gly Phe Asn
            260   265   270

Gly Ile Tyr Thr Tyr Ser Gly Glu Glu Phe Lys Ala Thr Ala Tyr Thr
            275   280   285

Ser Gly Ala Asn Phe Asn Lys Cys Lys Asn Thr Ile Arg Lys Ala Leu
    290   295   300

Lys Leu Asn Tyr Pro Cys Pro Tyr Gln Asn Cys Thr Phe Gly Gly Ile
305   310   315   320

Trp Asn Gly Gly Gly Gly Asn Gly Gln Lys Asn Leu Phe Ala Ser Ser
            325   330   335

Ser Phe Phe Tyr Leu Pro Glu Asp Thr Gly Met Val Asp Ala Ser Thr
            340   345   350

Pro Asn Phe Ile Leu Arg Pro Val Asp Ile Glu Thr Lys Ala Lys Glu
            355   360   365

Ala Cys Ala Leu Asn Phe Glu Asp Ala Lys Ser Thr Tyr Pro Phe Leu
    370   375   380

Asp Lys Lys Asn Val Ala Ser Tyr Val Cys Met Asp Leu Ile Tyr Gln
385   390   395   400

Tyr Val Leu Leu Val Asp Gly Phe Gly Leu Asp Pro Leu Gln Lys Ile
            405   410   415

Thr Ser Gly Lys Glu Ile Glu Tyr Gln Asp Ala Ile Val Glu Ala Ala
            420   425   430

Trp Pro Leu Gly Asn Ala Val Glu Ala Ile Ser Ala Leu Pro Lys Phe
Page 24

                435   440   445

Glu Arg Leu Met Tyr Phe Val
    450   455

<210> 11

<211> 454

<212> PRT

<213> Solanum tuberosum

<400> 11

Met Leu Asn Gln Asn Ser His Phe Ile Phe Ile Ile Leu Ala Ile Phe
1   5   10   15

Leu Val Leu Pro Leu Ser Leu Leu Ser Lys Asn Val Asn Ala Gln Ile
            20   25   30

Pro Leu Arg Arg His Leu Leu Ser His Glu Ser Glu His Tyr Ala Val
        35   40   45

Ile Phe Asp Ala Gly Ser Thr Gly Ser Arg Val His Val Phe Arg Phe
    50   55   60

Asp Glu Lys Leu Gly Leu Leu Pro Ile Gly Asn Asn Ile Glu Tyr Phe
65   70   75   80

Met Ala Thr Glu Pro Gly Leu Ser Ser Tyr Ala Glu Asp Pro Lys Ala
                85   90   95

Ala Ala Asn Ser Leu Glu Pro Leu Leu Asp Gly Ala Glu Gly Val Val
            100   105   110

Pro Gln Glu Leu Gln Ser Glu Thr Pro Leu Glu Leu Gly Ala Thr Ala
        115   120   125

Gly Leu Arg Met Leu Lys Gly Asp Ala Ala Glu Lys Ile Leu Gln Ala
    130   135   140

Val Arg Asn Leu Val Lys Asn Gln Ser Thr Phe His Ser Lys Asp Gln
145   150   155   160

Trp Val Thr Ile Leu Asp Gly Thr Gln Glu Gly Ser Tyr Met Trp Ala
                165   170   175

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Ala Ile Asn Tyr Leu Leu Gly Asn Leu Gly Lys Asp Tyr Lys Ser Thr
        180   185   190

Thr Ala Thr Ile Asp Leu Gly Gly Gly Ser Val Gln Met Ala Tyr Ala
     195   200   205

Ile Ser Asn Glu Gln Phe Ala Lys Ala Pro Gln Asn Glu Asp Gly Glu
    210   215   220

Pro Tyr Val Gln Gln Lys His Leu Met Ser Lys Asp Tyr Asn Leu Tyr
225   230   235   240

Val His Ser Tyr Leu Asn Tyr Gly Gln Leu Ala Gly Arg Ala Glu Ile
        245   250   255

Phe Lys Ala Ser Arg Asn Glu Ser Asn Pro Cys Ala Leu Glu Gly Cys
        260   265   270

Asp Gly Tyr Tyr Ser Tyr Gly Gly Val Asp Tyr Lys Val Lys Ala Pro
       275   280   285

Lys Lys Gly Ser Ser Trp Lys Arg Cys Arg Arg Leu Thr Arg His Ala
    290   295   300

Leu Lys Ile Asn Ala Lys Cys Asn Ile Glu Glu Cys Thr Phe Asn Gly
305   310   315   320

Val Trp Asn Gly Gly Gly Gly Asp Gly Gln Lys Asn Ile His Ala Ser
        325   330   335

Ser Phe Phe Tyr Asp Ile Gly Ala Gln Val Gly Ile Val Asp Thr Lys
        340   345   350

Phe Pro Ser Ala Leu Ala Lys Pro Ile Gln Tyr Leu Asn Ala Ala Lys
        355   360   365

Val Ala Cys Gln Thr Asn Val Ala Asp Ile Lys Ser Ile Phe Pro Lys
    370   375   380

Thr Gln Asp Arg Asn Ile Pro Tyr Leu Cys Met Asp Leu Ile Tyr Glu
385   390   395   400

Tyr Thr Leu Leu Val Asp Gly Phe Gly Leu Asn Pro His Lys Glu Ile
        405   410   415

Thr Val Ile His Asp Val Gln Tyr Lys Asn Tyr Leu Val Gly Ala Ala
        420   425   430

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```
Trp Pro Leu Gly Cys Ala Ile Asp Leu Val Ser Ser Thr Thr Asn Lys
        435             440             445
```

```
Ile Arg Val Ala Ser Ser
        450
```

<210> 12

<211> 473

<212> PRT

<213> Saccharomyces cerevisiae

<400> 12

```
Lys Thr Pro Glu Asp Ile Ser Ile Ile Pro Val Asn Asp Glu Pro Gly
1               5               10              15
```

```
Tyr Leu Gln Asp Ser Lys Thr Glu Gln Asn Tyr Pro Glu Leu Ala Asp
            20              25              30
```

```
Ala Val Lys Ser Gln Thr Ser Gln Thr Cys Ser Glu Glu His Lys Tyr
        35              40              45
```

```
Val Ile Met Ile Asp Ala Gly Ser Thr Gly Ser Arg Val His Ile Tyr
    50              55              60
```

```
Lys Phe Asp Val Cys Thr Ser Pro Pro Thr Leu Leu Asp Glu Lys Phe
65              70              75              80
```

```
Asp Met Leu Glu Pro Gly Leu Ser Ser Phe Asp Thr Asp Ser Val Gly
            85              90              95
```

```
Ala Ala Asn Ser Leu Asp Pro Leu Leu Lys Val Ala Met Asn Tyr Val
            100             105             110
```

```
Pro Ile Lys Ala Arg Ser Cys Thr Pro Val Ala Val Lys Ala Thr Ala
        115             120             125
```

```
Gly Leu Arg Leu Leu Gly Asp Ala Lys Ser Ser Lys Ile Leu Ser Ala
    130             135             140
```

```
Val Arg Asp His Leu Glu Lys Asp Tyr Pro Phe Pro Val Val Glu Gly
145             150             155             160
```

```
Asp Gly Val Ser Ile Met Gly Gly Asp Glu Glu Gly Val Phe Ala Trp
            165             170             175
```

Ile Thr Thr Asn Tyr Leu Leu Gly Asn Ile Gly Ala Asn Gly Pro Lys
        180   185   190

Leu Pro Thr Ala Ala Val Phe Asp Leu Gly Gly Gly Ser Thr Gln Ile
        195   200   205

Val Glu Glu Pro Thr Phe Pro Ile Asn Glu Lys Met Val Asp Gly Glu
    210   215   220

His Lys Phe Asp Leu Lys Phe Gly Asp Glu Asn Tyr Thr Leu Tyr Gln
225   230   235   240

Phe Ser His Leu Gly Tyr Gly Leu Lys Glu Gly Arg Asn Lys Val Asn
                245   250   255

Ser Val Leu Val Glu Asn Ala Leu Lys Asp Lys Ile Leu Lys Gly Cys
            260   265   270

Asn Thr Lys Thr His Cys Leu Ser Ser Pro Cys Leu Pro Pro Lys Val
        275   280   285

Asn Ala Thr Asn Glu Lys Val Thr Leu Glu Ser Lys Glu Thr Tyr Thr
    290   295   300

Ile Asp Phe Ile Gly Pro Asp Glu Pro Ser Gly Ala Gln Cys Arg Phe
305   310   315   320

Leu Thr Asp Glu Ile Leu Asn Lys Asp Ala Gln Cys Gln Ser Pro Pro
                325   330   335

Cys Ser Phe Asn Gly Val His Gln Pro Ser Leu Val Arg Thr Phe Lys
            340   345   350

Glu Ser Asn Asp Ile Tyr Ile Phe Ser Tyr Phe Tyr Asp Arg Thr Thr
        355   360   365

Arg Pro Leu Gly Met Pro Leu Ser Phe Thr Leu Asn Glu Leu Asn Asp
    370   375   380

Leu Ala Arg Ile Val Cys Lys Gly Glu Glu Thr Trp Asn Ser Val Phe
385   390   395   400

Ser Gly Ile Ala Gly Ser Leu Asp Glu Leu Glu Ser Asp Ser His Phe
            405   410   415

Cys Leu Asp Leu Ser Phe Gln Val Ser Leu Leu His Thr Gly Tyr Asp

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Ile Pro Leu Gln Arg Glu Leu Arg Thr Gly Lys Lys Ile Ala Asn Lys
        435   440   445

Glu Ile Gly Trp Cys Leu Gly Ala Ser Leu Pro Leu Leu Lys Ala Asp
    450   455   460

Asn Trp Lys Cys Lys Ile Gln Ser Ala
465   470

<210> 13

<211> 153

<212> PRT

<213> Homo sapiens

<400> 13

Lys Tyr Gly Ile Val Leu Asp Ala Gly Ser Ser His Thr Ser Leu Tyr
1   5   10   15

Ile Tyr Lys Trp Pro Ala Glu Lys Glu Asn Asp Thr Gly Val Val His
            20   25   30

Gln Val Glu Glu Cys Arg Val Lys Gly Pro Gly Ile Ser Lys Phe Val
        35   40   45

Gln Lys Val Asn Glu Ile Gly Ile Tyr Leu Thr Asp Cys Met Glu Arg
    50   55   60

Ala Arg Glu Val Ile Pro Arg Ser Gln His Gln Glu Thr Pro Val Tyr
65   70   75   80

Leu Gly Ala Thr Ala Gly Met Arg Leu Leu Arg Met Glu Ser Glu Glu
                85   90   95

Leu Ala Asp Arg Val Leu Asp Val Val Glu Arg Ser Leu Ser Asn Tyr
            100   105   110

Pro Phe Asp Phe Gln Gly Ala Arg Ile Ile Thr Gly Gln Glu Glu Gly
            115   120   125

Ala Tyr Gly Trp Ile Thr Ile Asn Tyr Leu Leu Gly Lys Phe Ser Gln
    130   135   140

Lys Thr Arg Trp Phe Ser Ile Val Pro
145   150

<210> 14

<211> 154

<212> PRT

<213> Rattus norvegicus

<400> 14

Val Lys Tyr Gly Ile Val Leu Asp Ala Gly Ser Ser His Thr Asn Leu
1   5   10   15

Tyr Ile Tyr Lys Trp Pro Ala Glu Lys Glu Asn Asp Thr Gly Val Val
                20   25   30

Gln Leu Leu Glu Glu Cys Gln Val Lys Gly Pro Gly Ile Ser Lys Tyr
            35   40   45

Ala Gln Lys Thr Asp Glu Ile Ala Ala Tyr Leu Ala Glu Cys Met Lys
        50   55   60

Met Ser Thr Glu Arg Ile Pro Ala Ser Lys Gln His Gln Thr Pro Val
65   70   75   80

Tyr Leu Gly Ala Thr Ala Gly Met Arg Leu Leu Arg Met Glu Ser Lys
                85   90   95

Gln Ser Ala Asp Glu Val Leu Ala Ala Val Ser Arg Ser Leu Lys Ser
                100   105   110

Tyr Pro Phe Asp Phe Gln Gly Ala Lys Ile Ile Thr Gly Gln Glu Glu
            115   120   125

Gly Ala Tyr Gly Trp Ile Thr Ile Asn Tyr Leu Leu Gly Arg Phe Thr
        130   135   140

Gln Glu Gln Ser Trp Leu Asn Phe Ile Ser
145   150

<210> 15

<211> 153

<212> PRT

<213> Homo sapiens

<400> 15

```
Lys Tyr Gly Ile Val Leu Asp Ala Gly Ser Ser His Thr Ser Met Phe
1               5                   10                  15
```

```
Ile Tyr Lys Trp Pro Ala Asp Lys Glu Asn Asp Thr Gly Ile Val Gly
                20                  25                  30
```

```
Gln His Ser Ser Cys Asp Val Pro Gly Gly Gly Ile Ser Ser Tyr Ala
            35                  40                  45
```

```
Asp Asn Pro Ser Gly Ala Ser Gln Ser Leu Val Gly Cys Leu Glu Gln
        50                  55                  60
```

```
Ala Leu Gln Asp Val Pro Lys Glu Arg His Ala Gly Thr Pro Leu Tyr
65                  70                  75                  80
```

```
Leu Gly Ala Thr Ala Gly Met Arg Leu Leu Asn Leu Thr Asn Pro Glu
                85                  90                  95
```

```
Ala Ser Thr Ser Val Leu Met Ala Val Thr His Thr Leu Thr Gln Tyr
            100                 105                 110
```

```
Pro Phe Asp Phe Arg Gly Ala Arg Ile Leu Ser Gly Gln Glu Glu Gly
            115                 120                 125
```

```
Val Phe Gly Trp Val Thr Ala Asn Tyr Leu Leu Glu Asn Phe Ile Lys
    130                 135                 140
```

```
Tyr Gly Trp Val Gly Arg Trp Phe Arg
145                 150
```

<210> 16

<211> 150

<212> PRT

<213> Gallus gallus

<400> 16

```
Phe Lys Tyr Gly Ile Val Leu Asp Ala Gly Ser Ser His Thr Ala Val
1               5                   10                  15
```

```
Phe Ile Tyr Lys Trp Pro Ala Asp Lys Glu Asn Asp Thr Gly Val Val
                20                  25                  30
```

```
Ser Glu His Ser Met Cys Asp Val Glu Gly Pro Gly Ile Ser Ser Tyr
        35              40              45

Ser Ser Lys Pro Pro Ala Ala Gly Lys Ser Leu Glu His Cys Leu Ser
    50          55              60

Gln Ala Met Arg Asp Val Pro Lys Glu Lys His Ala Asp Thr Pro Leu
65              70              75              80

Tyr Leu Gly Ala Thr Ala Gly Met Arg Leu Leu Thr Ile Ala Asp Pro
                85              90              95

Pro Ser Gln Thr Cys Leu Ser Ala Val Met Ala Thr Leu Lys Ser Tyr
            100             105             110

Pro Phe Asp Phe Gly Gly Ala Lys Ile Leu Ser Gly Glu Glu Glu Gly
        115             120             125

Val Phe Gly Trp Ile Thr Ala Asn Tyr Leu Leu Glu Asn Phe Ile Lys
    130             135             140

Arg Gly Trp Leu Gly Glu
145             150
```

<210> 17

<211> 148

<212> PRT

<213> Caenorhabditis elegans

<400> 17

```
Ile Lys Tyr Gly Val Ile Cys Asp Ala Gly Ser Ser Gly Thr Arg Leu
1           5               10              15

Phe Val Tyr Thr Leu Lys Pro Leu Ser Gly Gly Leu Thr Asn Ile Asp
            20              25              30

Thr Leu Ile His Glu Ser Glu Pro Val Val Lys Lys Val Thr Pro Gly
        35              40              45

Leu Ser Ser Phe Gly Asp Lys Pro Glu Gln Val Val Glu Tyr Leu Thr
    50          55              60

Pro Leu Leu Arg Phe Ala Glu Glu His Ile Pro Tyr Glu Gln Leu Gly
```

Glu Thr Asp Leu Leu Ile Phe Ala Thr Ala Gly Met Arg Leu Leu Pro
              85   90   95

Glu Ala Gln Lys Asp Ala Ile Ile Lys Asn Leu Gln Asn Gly Leu Lys
              100   105   110

Ser Val Thr Ala Leu Arg Val Ser Asp Ser Asn Ile Arg Ile Ile Asp
              115   120   125

Gly Ala Trp Glu Gly Ile Tyr Ser Trp Ile Ala Val Asn Tyr Ile Leu
        130   .   135   140

Gly Arg Phe Asp
145

<210>   18

<211>   10

<212>   RNA

<213>   Mus musculus

<400>   18
aagaauaugg   10

<210>   19

<211>   10

<212>   RNA

<213>   Vertebrate

<400>   19
gccgccaugg   10

<210>   20

<211>   20

<212>   DNA

<213>   Artificial Sequence

<220>

<223> Primer

<400> 20
ccagactgta aatcttttgg   20

<210> 21

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 21
agggaatgta ataagggtag   20

<210> 22

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 22
ctgcttgagt gacgtctctg   20

<210> 23

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 23
cacatgaggt tcagctcgtg   20

<210> 24

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 24
gtgaagtggc tgccttcagg   20

<210> 25

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 25
cctttgactc gggactccag   20

<210> 26

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 26
gaactgctgc ctaaccactc   20

<210> 27

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 27
attgatgggt cttgggattg c   21

<210> 28

<211> 10

<212> RNA

<213> Homo sapiens

<400> 28
augugaauga   10

<210> 29

<211> 10

<212> RNA

<213> Homo sapiens

<400> 29
acaaggauga   10

<210> 30

<211> 6

<212> RNA

<213> Homo sapiens

<400> 30
aauaaa   6

<210> 31

<211> 20

<212> DNA

<213> Homo sapiens

<400> 31
caggtcactt atggagcctg   20

<210> 32

<211>   18

<212>   DNA

<213>   Homo sapiens

<400>   32
ccatggacaa aataggac   18